

# REPORT CARD OF THE OEP

## State of the Evolution

To date, the aviation community has realized the following operational improvements set forth in the OEP:

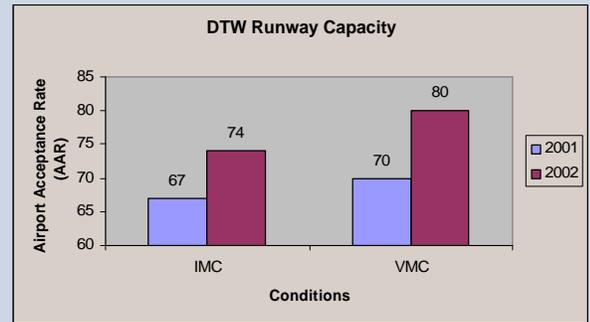
- ➔ ***Increased arrival and departure rates***
  - New runways have been constructed at the Phoenix and Detroit airports
  - All choke point actions are complete
  - The Traffic Management Advisor (TMA) is operational at seven sites
  - New and overlay area navigation (RNAV) routes have been implemented
  - The Administrator's Policy on Required Navigation Performance (RNP) has been implemented
  - Las Vegas implemented the four corner post airspace redesign
- ➔ ***Decreased en route congestion***
  - All choke point actions are complete
  - The User Request Evaluation Tool (URET) is now operational in six centers
  - The Controller Pilot Data Link Communications (CPDLC) Build 1 tool is in use at Miami Center
  - There are more web-based collaborative tools and better quality data for managing congestion
  - Gulf of Mexico RNAV routes have been implemented
- ➔ ***Improved flight during unfavorable airport weather conditions***
  - Installed Precision Runway Monitor (PRM) at Minneapolis-St. Paul and Philadelphia airports, and operationally validated benefits
  - The first production unit of the Integrated Terminal Weather System (ITWS) is in use at Atlanta
  - Runway Visual Range data is now provided to users via Collaborative Decision Making Network (CDMNet) and available to more than 49 airports
  - Precision approaches Instrument Landing System (ILS) has been implemented at 14 airports
- ➔ ***Improved flight during severe en route weather conditions***
  - Ground delay programs are being executed with improved compliance
  - The Collaborative Convective Forecast Product (CCFP) extended range forecast of thunderstorms is available on the Command Center Website
  - The Playbook has been expanded to 114 plans to provide more options
  - Weather radar data is now available on en route controller's display
  - The Flow Evaluation Areas (FEA)/Flow Constrained Areas (FCA) Collaborative Routing Coordination Tools (CRCT) prototype functions have been implemented on the Enhanced Traffic Management System (ETMS).
  - Implemented Virginia Capes (VACAPES) agreement on use of east coast warning area airspace for hazardous weather avoidance

Each of these initiatives increased the capacity and efficiency of the NAS, and has provided direct benefit to NAS users. Many of these represent the initial installment of a longer-term plan or water fall.

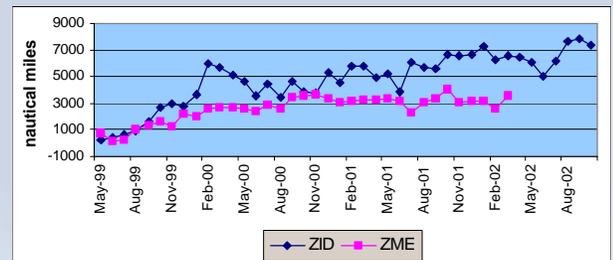
## Overview of 2002 Performance Results

Overall, capacity at the OEP airports has increased over 2% since OEP inception. Although decreased demand levels did influence overall peak throughput in 2002, the peak visual throughput index at 15 of the 34 airports studied (or nearly 45%) were higher than in 2000. Compared to the OEP baseline year 2000, delays have fallen by approximately 30%, while traffic volume changes have varied throughout the NAS, ranging from 5% at the en route centers to approximately 15% at the pacing airports.

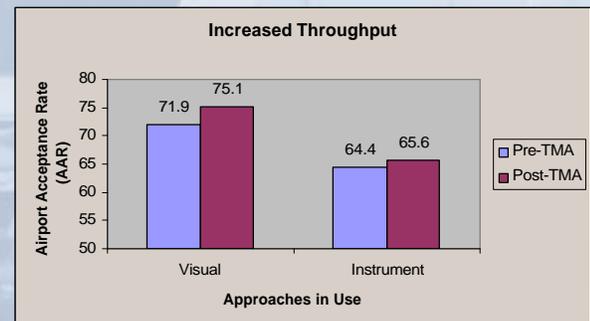
- ✓ The Detroit runway became operational December 11, 2001. By Spring 2002, the Airport Capacity Visual Meteorological Conditions (VMC) index (representing the available capacity) was up 16%, and Airport Throughput VMC index (representing what was serviced on average during the peak of arrivals and departures) was up about nine percent.
- ✓ Forty RNAV routes have been completed.
- ✓ Las Vegas implemented the Four Corner Post Airspace Redesign in December 2001. Las Vegas became the first major airport to use RNAV arrival and departure procedures for all runways. Preliminary results confirmed predictions of significant user savings.
- ✓ All choke point actions were implemented. By August 2001, with over 70% of the action items completed, an interim analysis showed performance improvement in five of the seven choke points, equating to approximately \$38M in cost savings to aviation system users. Traffic reduction after the September 11, 2001 terrorist attacks has made it difficult to show the system impacts of the completed action items. However, in Great Lakes en route airspace where traffic has rebounded to pre-September 11 levels, the actions resulted in impressive reductions in delay (15%-40%, depending on the choke point).
- ✓ URET has allowed restriction removals and lateral amendments have saved approximately 7000 nautical miles (nmi)/day at Indianapolis and 3500 nmi/day at Memphis.
- ✓ Chokepoint actions, CDM and URET together allowed the maximum hourly occupancy in the Midwest centers (Cleveland, Indianapolis and Chicago) to reach 102.5% of the 2001 levels.
- ✓ The TMA is in use at seven centers supporting arrival metering and merging. Three sites (Dallas, Minneapolis, and Los Angeles) experienced a five percent increase in throughput, and Denver experienced a two percent gain.
- ✓ PRM in Minneapolis provided an increase in arrival rates of six percent or better, which equates to four more flights per hour, while in operation. Operations have since been suspended, however the FAA is working to reestablish operations.



*Detroit Runway Capacity Gains*



*URET Distance Saved for Lateral Amendments Daily Average*



*Increased Throughput from TMA at Minneapolis*

## Capacity Expectations

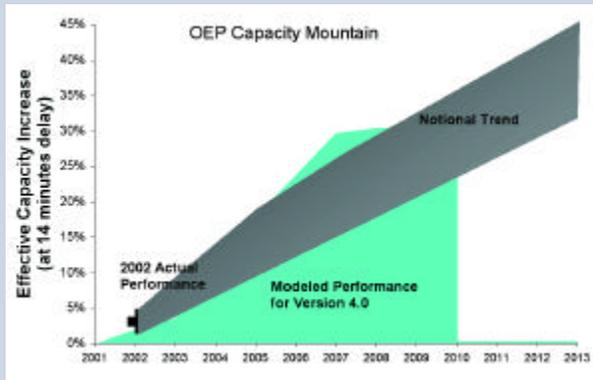
The OEP Capacity Growth Chart projects the cumulative modeled capacity gains from OEP commitments. We are moving in a positive direction and have met our projections for 2002. The near term projections reflect significant capacity growth as a result of Reduced Vertical Separation Minima (RVSM), airspace redesign, and several new runways that will be put into service over the next two years. We also will continue to add more URET and ITWS sites, and a number of other capacity enhancements.

Capacity projections for the out-years will increase since two runways and four TMA sites were added as part of Version 5.0. Also impacting projected growth will be a number of programs that are planned, including 10 more proposed runway projects at benchmark airports, a focused effort to promote various airport initiatives (improvements to airports such as runway and taxiway enhancements), RNP, and significant enhancements to the current Collaborative Decision Making (CDM) philosophy. On the negative side, the expected gains will be diminished by the Charlotte runway that was dropped due to the local situation. In addition, some of the projected gains will slide to the right as two runways were delayed (ATL and SEA), also due to local situations. Furthermore, CPDLC has been delayed due to various difficulties. During 2003, the capacity mountain will be recalculated once the airport benchmarks and the terminal area forecasts are updated.

This year, we closed two solution sets: Reduce Offshore Separation and Provide Access to Special Use Airspace (SUA). Reduce Offshore Separation is closed because the technology solution could not be achieved and no viable alternatives are currently available; other activities involving the Gulf, such as RVSM and RNAV routes, are in other solution sets. The SUA solution set is closed because the milestones were successfully completed. Some initiatives involving “access” are in other solution sets, while others are part of ongoing activities not related to OEP. Neither of these solution sets contributed to the capacity mountain assumptions. In addition, new smart sheets have been added for airport weather to capture wake mitigation and along track separation procedures.

## 2002 Experiences from the Evolution

During good economic times, real change happens slowly with significant preplanning and coordination. Under the current circumstances, uncertainty in timing and in some cases even the viability of the industry partners make coordination and commitment more complicated. Despite the FAA's best efforts to achieve and retain a Government and industry commitment for the OEP implementation, the outlook for significant, partnered investment is dimmed by growing security costs and airline industry restructuring. With version 5, many plans for new runways, equipage of aircraft, and participation in new procedures are under review. Examining which 2002 accomplishments went smoothly, and discovering what created the difficulties in others, should improve the community's ability to manage the OEP implementation in spite of these uncertainties.



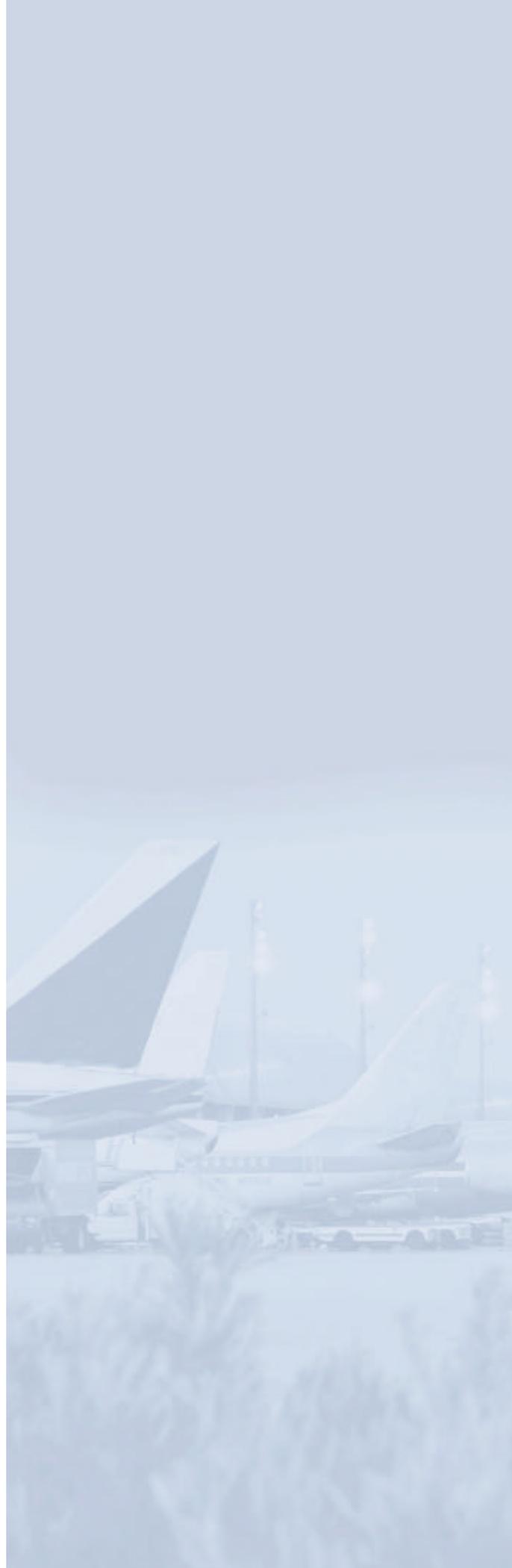
*Modeled capacity gains for Version 4.0 and anticipated trends from Version 5.0*

Ground based capabilities and joint activities that were in development for several years (e.g., CPDLC trials), generally had minor disconnects that were resolved in the routine course of implementation. In some cases, technology failed to deliver the operational change in a cost effective way, e.g., Gulf of Mexico communications, so new strategies were adapted. The greatest difficulties came from changes affecting both flight planning and pilots and controller training, e.g., PRM and LAS redesign. The implications of the transition of LAS to an all RNAV airport was not well understood, and the resulting mixed operational practices created chaos. Much was gained from this experience which validated the significant benefits that would follow these changes. With the successful conclusion of the System Choke Points Program, the FAA has embarked on an initiative with the RTCA's Free Flight Select Committee's Airspace Working Group to engage aviation users and stakeholders on a regular basis, producing a consensus view of airspace priorities and aligning resources with those priorities.

Where equipage had been preplanned, the community has re-entered the planning stage. Plans for cockpit display procedures and CPDLC moved forward in 2002, but it became clear that any solid plans are still a few years away.

Axiomatic to the OEP is the concept that benefits are realized by users who equip with new technology and change their operations to reflect new ATC techniques. Over the past 18 months, it is clear that demand and therefore equipage is highly elastic. In out-year research efforts, the FAA committed to significant user equipage costs. This strategy, used in the Safe Flight 21 project, enabled concept validation and benefit determination. In contrast, Controller Pilot Data Link Communications that relies on airlines to bear the cost of equipage is unable to move forward with national implementation until a critical mass of aircraft equip and controller workload is reduced. Furthermore, the challenge is circular: a benefit must exist to support industry investment but the benefit depends on user equipage.

Another complex, circular issue surrounds the certification of ground-based and avionics systems. In the past, certification dealt principally with aircraft equipment. The OEP requires a closer interoperability of ground and air-based systems. This in turn drives the need for a true systems-level engineering analysis and allocation of safety validation across these systems and therefore, government and industry boundaries. As a community we have begun this process within RTCA's Concept of Equipage and OEP Working Group efforts. However, to detail a true evolutionary implementation, we must derive a compelling cost benefit across the community with frequent re-evaluation as we encounter the inherent challenges of complex systems development.



## Community Challenges

The OEP was established to coordinate community efforts to expand the capacity and improve the efficiency of the NAS. Routine discovery of community challenges is a natural part of this endeavor. In most cases, identified challenges are resolved so the community can adhere to the original plan. In other cases, the challenge will require a change in strategy with the focus remaining on the original objective. For example, this year's efforts to complete voice communications in the Gulf of Mexico would have enabled domestic non-radar procedures for that airspace. When technological failures precluded this plan, we looked to other procedures to support the original goal of achieving greater capacity in the Gulf of Mexico.

A wide range of challenges face the community implementation efforts in the coming year. Prepared with the lessons learned from the 2002 experiences, the FAA will work with the community for a successful OEP implementation. The most significant challenges are listed below. These complex issues will require leadership and greater industry stability than exists today. In some cases leadership will be governmental and in others industry is better suited for the role. Working with RTCA, the FAA remains optimistic that these issues will be resolved in the best interests of the flying public and the nation's economy.

- **RNP Standards and Flyability:** In 2003, the FAA will publish criteria for RNP-2 and RNP-0.3. This step is only the beginning of the effort to develop flyable routes for cruise, arrival and departure. From the experience gained in developing RNAV routes, the community now understands the coordination of vendor and user data, plans for training, and other issues involved to avoid the need for rework of airspace designs and procedures.
- **Reestablishing PRM Operations:** PRM Operations were suspended in Minneapolis following a reevaluation of safety implications in a mixed environment of participants and non-participants; however, the operational application was successful. The FAA is coordinating a proposal to resume operations with users.
- **New Runway Surveillance:** New runways are being built at less than standard spacing. Funding and surveillance needs to support parallel operations at these airports are unresolved.
- **Crossing Procedures:** Procedures to address crossing runways require joint FAA industry acceptance.
- **Unified Surface Approach:** Several airports and users have programs underway to improve surface coordination. At the same time the FAA is trying to establish a national approach for traffic management use.
- **CPDLC National Deployment:** Economics will slow the pace of equipage. The FAA has cost issues with certification.
- **Integrated Community Schedule:** Some joint deadlines were missed due to unilateral priority changes without informing others.